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# Guest Editorial: Recent Trends in Routing

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Following the success of the first VeRoLog conference at the Università di Bologna in 2012, the second VeRoLog conference was held from July 7 to July 10, 2013 at the University of Southampton, UK. The organizing committee consisted of Prof Chris Potts, Prof Julia Bennell, Dr Maria Battarra, and Dr Güneş Erdoğan. The conference was of interest to academics and practitioners alike, with a total of 105 presentations received and 113 participants hosted. Further details of the conference are available at <https://www.ocs.soton.ac.uk/index.php/verolog/verolog2013>.

This special issue of Networks consists of studies presented at VeRoLog 2013. The presentations explored diverse aspects of vehicle routing problems, ranging from the time component to the route length balance, with various applications ranging from waste collection to supplier selection. Through a meticulous refereeing process, we believe that we were able to select a subset of high quality papers that reflect the state-of-art of the research on vehicle routing.

“Timing problems and algorithms: Time decisions for sequences of activities”, co-authored by Vidal, Crainic, Gendreau, and Prins, focuses on the timing problems arising in a large number of fields, including production, project scheduling, statistical inference, network optimization, and vehicle routing. They present a classification scheme together with a categorization of complexity. They also underline the importance of re-optimization algorithms for timing problems and introduce a framework of formalism for describing them.

Avella, Boccia, and Wolsey study the Vendor Managed Inventory Routing Problem in their paper entitled “Single-item reformulations for a Vendor Managed Inventory Routing Problem: computational experience with

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benchmark instances”, which requires the solution of the joint problem of lot-sizing for each customer and a vehicle routing problem for each time period. They analyze the replenishment policies of “Order-Up” and “Maximum Level”, and present formulations that exploit the properties of the test instances. They also introduce two new families of valid inequalities.

“A branch-and-cut algorithm for the Multi-Vehicle Traveling Purchaser Problem with Pairwise Incompatibility Constraints” by Manerba and Mansini analyzes the problem of selecting a subset of suppliers to visit and purchase various products with minimum total cost of purchasing and traveling, and the restrictions imposed by incompatible pairs of products that cannot be transported simultaneously. They provide a branch-and-cut algorithm in addition to a four-step constructive heuristic that utilizes Beam Search.

Rodrigues and Ferreira tackle a real-life waste collection routing problem in their paper “Waste Collection Routing - Limited Multiple Landfills and Heterogeneous Fleet”, which arises in Monção, Portugal. They analyze three scenarios with varying numbers and types of disposal sites as well as vehicles, and provide a separate formulation for each scenario. The solutions determined through the formulations provide viable and efficient alternatives to the routes currently being used.

Bektaş and Lysgaard study the problem of balancing vehicle routes in their paper “Optimal vehicle routing with lower and upper bounds on route durations”. They present a new exact algorithm for this problem, which utilizes mixed-integer linear programming and cutting planes. They perform computational experiments with Desrochers-Laporte, Miller-Tucker-Zemlin, and single-commodity flow based connectivity constraints, using instances from the TSPLIB.

In the final paper of this special issue, Bögl, Doerner, and Parragh present the “The school bus routing and scheduling problem with transfers”, where pupils may change buses during their transportation from home to school. They analyze the negative effect of transfers on the quality of service due to transfers as well as the positive effect due to reduced average user ride times. They report results that significantly decrease the total operating costs while average and maximum ride times are comparable to the solutions without transfers.

We hope that this special issue of Networks will be a milestone in shaping the future of the research on vehicle routing, and wish that the success of the VeRoLog conferences continues with the conferences in Oslo (2014) and Vienna (2015).